SLOVENSKI STANDARD
oSIST prEN 16163:2010

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Ohranjanje kulturne dediščine - Osvetljevanje razstav kulturne dediščine

Conservation of cultural property - Exhibition lighting of cultural property

Erhaltung des kulturellen Erbes - Beleuchtung von Ausstellungen des kulturellen Erbes

Conservation des biens culturels - Eclairage d'exposition des biens culturels

Ta slovenski standard je istoveten z: **prEN 16163**

ICS:

91.160.10	Notranja razsvetljava	Interior lighting
97.195	Umetniški in obrtniški izdelki	Items of art and handicrafts

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Conservation of cultural property - Exhibition lighting of cultural property

Erhaltung des kulturellen Erbes - Beleuchtung von Ausstellungen des kulturellen Erbes

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (prEN 16163:2010) has been prepared by Technical Committee CEN/TC 346 “Conservation of cultural property”, the secretariat of which is held by UNI.

This document is currently submitted to the CEN Enquiry.

Introduction

Lighting is needed for many specific functions in museums and other cultural heritage organisations, for example for research, conservation and permanent or temporary exhibition. This standard deals only with lighting for permanent and temporary exhibitions in museums and galleries and does not consider lighting in other cultural heritage contexts such us hypogeal sites.

Lighting is one of the most important factors enabling visitors to fully enjoy works of art and other cultural property. In fact, light is the key element for the links with our environment: humans need light and their need increases with ageing. On the other hand conservation consideration must be taken to care for the objects for future generations since light is an environmental factor, which is a threat to many objects. Alone or in combination with other environmental factors (temperature, humidity, pollution, etc.) light causes fading, discoloration and embrittlement to a wide range of materials. This damage is cumulative and irreversible: no conservation treatment can restore change of colour or loss in strength of materials damaged by light. Accordingly, the challenge of museum display lighting is to find an appropriate compromise between the requirements of the conservation and the needs of visitors and of a suitable exhibition design. As an integral part of an exhibition, display lighting contains both objective and subjective aspects:

— the conservation aspect – sensitivity of the object, spectral composition of the light source and total luminous exposure,

— the visual aspect – the impact of lighting on the visitor experience: lighting must give visitors a good view of presented objects, without glare, reflects or insufficient illumination,

— the exhibition design aspect – the lighting design must participate with the interpretation and be meaningful.

1 Scope

This document defines the procedures as well as the means to implement good lighting, with regard to the conservation policy, but still regarding the conditions of visibility and exhibition design. It aims at providing a tool for setting up a European common policy and a guide for help curators, conservators and project managers to give to the architects and designers a correct lighting program with a European reference.

2 Normative references

Not applicable.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
annual light exposue
illuminance level multiplied by the time for which the object is exposed at that level. It is expressed in lux-hours per year (lxh/y). One year of museum display is approximately 3000 hours. See also total luminous exposure

3.2
blue wool scale
scale of light-fastness, which comprises eight categories of standard dyed wools. The first is the most responsive to light; the second is approximately half as responsive as the first; and so on to the eighth, which is the least responsive

3.3
colour rendering index (CRI)
measure of the degree to which the psychophysical colour of an object illuminated by the test source conforms to that of the same object illuminated by the reference illuminant, suitable allowance having been made for the state of chromatic adaptation

NOTE The general colour rendering index (Ra) is calculated on eight Munsell samples, all of which have low to moderate chromatic saturation. Theoretically, CRI spans between 100 (best conditions) and 0 (worst conditions). Usually for white sources CRI spans between 100 and 60.

3.4
colour temperature
temperature of a Planckian radiator whose radiation has the same chromaticity as that of given stimulus

NOTE The reason this measurement is called a "temperature" is because it was derived from a theoretical ideal object called a "black body radiator". When the radiator is heated, it changes from black to red to yellow to white to blue. The lower the Kelvin rating, the "warmer" or more yellow the light, while the higher the rating, the "cooler" or more blue the light. The unit is the Kelvin (K).

3.5
daylight
part of global solar radiation capable of causing a visual sensation. Daylight colour temperature can span from about 2500 K (at sunrise and sunset) to 20000 K (blue sky) and depends on day hour and season of the year

3.6
daylighting
lighting for which daylight is the light source. Formerly the term “natural light” was used, but “daylighting” is now in use in analogy with the term “electric lighting”

3.7
daylight factor
ratio of the illuminance at a point on a given plane due to the light received directly and indirectly from a sky of assumed or known luminance distribution, to the illuminance on a horizontal plane due to an unobstructed hemisphere of this sky. The contribution of direct sunlight to both illuminances is excluded

3.8
dosimeter
device or apparatus for total luminous exposure measurement during a given period of time

3.9
effective irradiance
results from weighting the irradiance with the spectral sensitivity at the different wavelengths

3.10
exhibition design
spatial interpretation of the curatorial purpose. It contains the design of showcases, colour setting, panels, sound and lighting

3.11
filter
any device that selects a more or less wide portion of the electromagnetic spectrum (coloured and neutral filters, conversion temperature blue (CTB) and conversion temperature orange (CTO) filters, anti-UV or anti-IR filters). Neutral-density filters decrease the transmitted light by a known amount without selecting any wavelength

3.12
illuminance
photometric quantity that corresponds to the radiometric quantity irradiance. Ratio between the luminous flux d Φ incident on an element of the surface containing the point, and the area dA of that element. It is measured in lux (lx)

3.13
illuminant
radiation with a relative spectral power distribution defined over the wavelength range that influences object colour perception. It is a mathematical function, which defines a specific spectral power distribution incident on the object. It cannot always be exactly realized with a source

3.14
infrared radiations (IR)
part of the electromagnetic radiation with wavelengths longer than those of the visible radiation, from about 780 nm to tens of micrometers

3.15
irradiance
radiometric quantity that is the ratio between the radiant flux d Φ_e incident on an element of the surface containing the point, and the area dA of that element. It is measured in watt per square meter W/m^2

3.16
light
light is the portion of the electromagnetic radiation to which the human eye is sensitive (*c.* 380 nm – 780 nm). In the field of conservation, this term extends the range outside the visible portion, including the ultraviolet (UV) and near infrared (IR) regions

3.17
lighting
art, devices or techniques used for illumination

3.18
light meter
apparatus for illuminance measurement

3.19
luminous flux
photometric quantity that corresponds to the radiometric quantity radiant flux. It is measured in lumen, lm

3.20
lux
lx. Unit of illuminance. Illuminance produced on a 1 m^2 surface by a luminous flux of 1 lumen uniformly distributed over that surface. 1 lx = 1 $lm.m^{-2}$

3.21
lux meter
see light meter

3.22
photometric quantities
quantities that are based on the perception of radiation by the human eye and are valid only for visible radiations

3.23
optical radiation
see light

3.24
radiant flux
radiometric quantity. It is the radiant energy transported per unit time into a region of space by the electromagnetic wave. It is measured in Watt, W

3.25
radiometric quantities
quantities that are based on purely objective physical measures

3.26
source
object that produces a radiant flux, visible (light) and/or not visible (e.g. UV, IR)

3.27
Spectral Reflectance Factor
characteristic of a material surface. It is the ratio of spectral reflected light by the object to spectral irradiance emitted by the illuminating source

3.28
spectral sensitivity
describes the wavelength dependence of the material properties as the result of a radiant exposure under otherwise equivalent conditions of exposure. It is dimensionless and assumes values between 0 and 1

3.29
total luminous exposure
photometric quantity. It is the sum of the illuminance level over a given period of time. It is measured in lux hours [lxh]